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November 23, 1992

Dr. Thomas E. Murley
Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Dr. Murley:

As you know, Northern States Power has placed on hold its application for license renewal of its Monticello facility. One of the reasons for this action is the regulatory uncertainty of the NRC's license renewal process. In light of this action, NSP would like to share with you a paper setting forth its perspectives on the license renewal process and specific actions which the Commission and NRC management should take to make the license renewal process work.

Sincerely,

Jay E. Silberg

Enclosure

0114-468jes.92

Perspectives on the License Renewal Process
(10 CFR Part 54)

Lead Plant License Renewal Project

Monticello Nuclear Generating Plant

Northern States Power Company

November 20, 1992

Executive Summary

Northern States Power serves as the Lead Boiling Water Reactor in the industry's Lead Plant License Renewal Program. The final license renewal rule (10 CFR Part 54) was issued in December, 1991. Over the course of the last year NSP has actively been applying the final rule by preparing a license renewal application. That application has been placed on hold. Four reasons for this hold have been cited. They are: 1) The uncertain resolution of the high level waste issue; 2) The uncertain resolution of the low level waste issue and rising costs resulting from that uncertainty; 3) A need to demonstrate the ability to continue excellent operations while reducing costs; and, 4) The regulatory uncertainties of the NRC license renewal process.

This paper presents Northern States Power Company's concerns and positions on issues which have arisen over the course of the last year as the final license renewal rule has been applied at our Monticello facility. The primary concerns are: 1) The NRC staff is inappropriately using the issuance of a "new license" as justification for consideration of matters beyond what is necessary to maintain the current licensing basis; and 2) The NRC staff is interpreting "maintaining the current licensing basis" in a manner that replaces a plant's licensing basis with new requirements.

The Commission has the authority under the Atomic Energy Act to structure the license renewal requirements as it sees fit to ensure public health and safety. The fact that the mechanism for renewal is a new license does not impose an automatic set minimum technical or regulatory requirements. With regard to the current licensing basis (CLB), we believe that the recognition that the CLB ensured safety and that the resulting focus should be maintaining it was a sound decision. Consistent with this decision we have prepared our application assuming that if we demonstrate the existing regulatory and code limits, utilizing the methods authorized by our CLB that we can be relicensed to operate for an additional 20 years. If generic issues are a identified they will be processed through the normal regulatory oversight process and applied to whichever license (initial or renewed) in force at that time.

We seek Commission participation in resolving these issues by providing policy level guidance to bring these issues to closure between the staff and industry. The final section of this report, Effect of Issues on the License Renewal Decision, summarizes those actions which we would ask the Commission and NRC Staff Executive Management to take.

Introduction

Northern States Power has been a key supporter of license renewal from the first efforts to develop a sound and sensible renewal process. We are serving as the Lead Boiling Water Reactor in the industry sponsored Lead Plant License Renewal Program. License renewal of the existing nuclear generating capacity is an important part of NSP's, and the nation's, energy strategy. We remain convinced that commercial nuclear power plants can be operated safely for 60 years or longer. However, in order to remain economic, the regulatory process must be focused on those elements concerned with reasonable assurance of safe operation. The Commission must provide clarification on the important policy issues contained in this paper or the process will lead to the improper conclusion that there is no economic advantage to relicensing existing plants.

The intent of this paper is to present Northern States Power Company's concerns and positions on issues which have developed over the course of the last year as the final license renewal rule has been applied at our Monticello facility. Two of our primary concerns are: 1) The NRC staff is inappropriately using the issuance of a "new license" as justification for consideration of matters beyond what is necessary to maintain the current licensing basis; and 2) The NRC staff is interpreting "maintaining the current licensing basis" in a manner that replaces a plant's licensing basis with new requirements. Ultimately, we seek Commission participation in resolving these issues by providing policy level guidance to bring these issues to closure between the staff and industry. The final section of this report, Effect of Issues on the License Renewal Decision, summarizes those actions which we would ask the Commission and NRC Staff Executive Management to take. These issues have had a direct bearing on the decision to place the Monticello license renewal application on hold. We seek to achieve resolution of these issues before we can move forward with the license renewal application.

Beyond the issues addressed in this paper regarding the license renewal rule a question has been raised concerning the relationship of the maintenance and license renewal

rules. NSP believes that the basic objectives of both rules are the same. That is, reasonable assurance that a system or structure will perform their required function. We encourage the work underway in the NRC and industry reviewing the potential for crediting the work done under the maintenance rule in license renewal space.

Background

Plant life extension work began on Monticello in 1983. In 1984, Monticello was selected as the Boiling Water Reactor Pilot Plant to evaluate the technical and economic feasibility of extending nuclear power plant life beyond the initial forty year license period established by the Atomic Energy Act. The conclusion of this work was that safe and economical operation of Monticello was feasible for at least an additional 30 years. At that time (1988), while the Atomic Energy Act allowed license renewal, no specific regulations were contained in the Code of Federal Regulations to govern the process for renewal. In order to develop and demonstrate the license renewal process, the lead plant program was instituted, sponsored by the Department of Energy through Sandia National Laboratories and the Electric Power Research Institute, and endorsed by the industry through the Nuclear Management and Resource Council. Monticello was selected as the Lead Boiling Water Reactor. NSP's Monticello plant is uniquely qualified to serve in this capacity because of the significant amount of work which has already been accomplished under the aforementioned pilot studies.

The first two years of the lead plant project were used primarily to investigate possible ways of defining the appropriate scope and depth of review necessary for license renewal. During 1990 and 1991 a significant amount of work was done, by way of public interactions with the NRC staff, to provide insights gained from the Monticello work. The final rule was promulgated by the Commission in late 1991. During 1992 the NRC staff has been working to provide regulatory guidance in the forms of a Standard Review Plan and Regulatory Guide consistent with their interpretation of the rule. Also during 1991 and 1992, NSP has been actively preparing a license renewal application for the Monticello plant.

Since the license renewal rule was promulgated, significant differences have been identified between the NRC staff's interpretation of the rule and NSP's understanding of its intent. These differences have become apparent as a result of our interactions with the staff as a pre-applicant, and in attending public meetings between the industry and the staff on the subject of plant aging and license renewal, as well as public briefings of the Advisory Committee on Reactor Safeguards. These differences are in areas basic to the philosophy of the license renewal process, such as: What does it mean to maintain the current licensing basis? These differences then cascade down to specific technical issues such as fatigue and equipment qualification. We believe the disparity between the staff's interpretation and NSP's will result in a large impact on the costs of license renewal without reasonable assurance of a corresponding increase in safety. Ultimately, these cost increases could affect our decision whether or not to pursue license renewal. This paper addresses the elements of our decision to pursue license renewal, as well as, the areas of concern that we currently have with the staff's interpretations of the license renewal rule.

Elements of the License Renewal Decision

Technical/Regulatory

First and foremost in the decision to pursue license renewal, and ultimately, extended operation of Monticello is the question: "Can the plant be operated safely during the period of extended operation?" This question is technical in nature. The requirements for answering this question are defined by the rules and regulations promulgated by the Commission. The Commission, therefore, defines the technical elements affecting the a decision of whether or not to pursue license renewal.

As cited above, the conclusion of the Plant Life Extension Pilot Studies was that there were no technical obstacles to extending the life of Monticello for at least

30 years. The basis for this conclusion was reached by comparing the Monticello plant against the existing technical requirements, as defined in Monticello's current licensing basis. This approach was confirmed by the Commission when it promulgated the final license renewal rule (10 CFR Part 54). The Commission based the license renewal rule on the principle that:

> "... with the exception of age-related degradation unique to license renewal and possibly some few other issues related to safety only during extended operation, the regulatory process is adequate to ensure that the licensing bases of all currently operating plants provide and maintain an acceptable level of safety for operation so that operation will not be inimical to public health and safety or common defense and security."

The conclusion of the pilot studies has been confirmed by the work done in preparing the license renewal application. In accordance with the license renewal rule, 107 systems (representing 65% of the plant and over 14,000 components) have been evaluated to ensure that the effects of aging will not challenge their ability to continue to perform their required functions, as they do now under the current licensing basis, during the extended period of operation. These evaluations have shown that, for the most part, the existing plant activities which detect, monitor, prevent and/or correct age related degradation are adequate. Only relatively minor enhancements have been necessary to meet the effective

program criteria of the rule as we understand it. No technical obstacles have been identified which would preclude safely extending the operation of the plant or license renewal.[1]

As we approach the decision to submit the license renewal application, a key factor will be whether the intent of the license renewal rule, as contained in the first principle, is being adhered to by the staff or whether the interpretation being adopted by the staff is expanding the original intent of the Commission. As was previously stated, in performing these evaluations the plant has been measured against the regulations, codes and standards which are in effect as part of the current licensing basis. Replacing the current licensing basis with new regulations or later versions of codes and standards will result in unwarranted costs being incurred, affecting the overall economics of extended operation. Introducing new requirements may give unwarranted credence to invalid or unconfirmed technical issues. This is of great concern because these potentially artificial issues could be used by opponents of nuclear power to challenge existing licenses.

Basing the license renewal rule on the foundation of the current licensing basis, as reasonably assured by the regulatory oversight process, was a sound and reasonable decision. Now, a demonstration of the stability of that decision by firmly applying the principles is necessary. Only then can utility management be sure that the technical element of the decision to proceed with license renewal does not put current plant operation at risk, is a predictable and economically a sound venture for the future. With the economic risks associated with the decision to pursue license renewal, stability of the regulatory process is essential.

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1 License renewal and actually extending operation are separate decisions. License renewal is a decision based on the ability to demonstrate safe operation of the plant. It is a precursor to the economic business decision to actually extend plant life.

Economics

The second element of the decision to proceed with license renewal deals with the economics of nuclear power versus alternative energy supplies. In 1988, as part of the plant life extension pilot studies, the first economic analysis of extended operation of Monticello was performed. The study concluded that there was a 4-to-1 benefit-to-cost ratio of continuing to operate Monticello for an additional 30 years versus building a replacement baseload fossil facility. No net present value to the customers was established under this study. It assumed that the operations and maintenance costs of Monticello would escalate at the same rate as those of the replacement fossil capacity.

Also in 1988, a second study was undertaken by NSP to quantify the effects of increasing operations and maintenance costs, as well as high capital expenditures on an ongoing basis, that nuclear power plants have experienced. The results of this study indicated that extended operation of Monticello represented a $350 million net present value to its customers when compared to building new baseload fossil capacity.

It was confirmed that this net present value was extremely sensitive to two factors: 1) Operations and maintenance costs, and 2) Continuing capital expenditures. An annual rise in operations and maintenance costs as low as 2.25 percent above inflation in real dollars would erode the $350 million net present value to the customer by year forty and make extended operation of Monticello equivalent to its replacement competition. This study was updated in 1991 and 1992. The updates showed that extended operation of Monticello still has a net present value of between $180 and $190 million to the customer. The reduction from 1988 to 1992 is attributed to a decrease in the cost of coal, refinement of the capital expenditure projections, and a more accurate assessment of increased license renewal costs. The original cost estimate for the license renewal process when

this project was initiated was $16 million. The cost of the overall process to preserve the option of extending operations is now estimated at $45 million. Issues introduced by the staff, such as fatigue and equipment qualification, could result in additional expenditures as high as $40 to $50 million, further reducing the net present value.

In addition to baseload coal facilities, natural gas, renewable energy resources and demand side management alternatives are being evaluated. Those studies, completed to date, have reinforced the current goals for NSP Nuclear Generation to control operations and maintenance costs at or below inflation, and average annual capital expenditures to less than $10 million per year. Both goals are significantly below historical trends but are considered realistic.

These goals are essential if nuclear is going to remain a viable generating option for Northern States Power. In reviewing the recent economic decisions to shutdown Yankee Rowe, San Onofre Nuclear Generating Station Unit 1 and Trojan, various effects can be seen which demonstrate the changing economic climate which nuclear operations must adjust to if they are going to remain viable options. Primary factors at Yankee Rowe included recessionary economics, (i.e., abundant low cost power not available three years ago) and uncertain regulatory requirements. At San Onofre, primary factors were the need for major capital expenditures to meet revised regulatory and design requirements and the existence of abundant hydro and natural gas resources. Finally, at Trojan, they faced major capital expenditures for steam generator replacement, competitive natural gas options and relatively high operations and maintenance costs.

Three factors are common to each situation: 1) Alternative energy costs, 2) Operations and maintenance costs, and 3) Capital expenditures. Alternative energy costs are not within the control of nuclear power plant owners. It is incumbent upon nuclear power plant owners, then, to control their operations and

maintenance costs and capital expenditures such that nuclear power remains competitive with alternative energy supplies. Nuclear must remain competitive even when compared to short term available, low cost alternative energy supplies if we are to avoid imposed shutdowns. If the license renewal process is viewed as jeopardizing the ability to control operations and maintenance costs and/or capital expenditures, no licensee will choose to pursue license renewal.

Political/Public Opinion

Waste is the issue in the political and public arena and must be resolved before the nuclear industry can expect to advance to extended operation of nuclear power plants. Until a satisfactory long-term solution to the high and low level waste issues is realized, as perceived by the public, the contention that nuclear power is an environmentally benign power source will never be accepted by the public, or state and local governmental and policy leaders. The basic issue for extended operation is how can a nuclear power plant owner be allowed to continue to generate waste for an additional twenty years if no solution for dealing with the waste generated under its current 40 year license is at hand or at least is being moved forward. NSP recognizes that there are programs to deal with the high and low level waste issues. However, the public's level of confidence in these programs is low at best. NSP will not submit a license renewal application until there is a clear path, that also has the confidence of the public, for the federal government to solve the spent fuel disposal problem.

Regardless of NSP's decision regarding license renewal for Monticello, we are subject to State law concerning radioactive waste management. Minnesota state law requires a Certificate of Need from the Public Utilities Commission prior to increasing the on-site spent fuel storage at a nuclear plant. This authority is not preempted by federal law, because the Public Utility Commission is determining whether or not the addition of storage capacity and continued operation of the

facility is financially justifiable. The capacity of Monticello's spent fuel storage pool will be reached near or just prior to the expiration of its current license (September 8, 2010). Thus, even if a renewed license is granted, the Public Utility Commission could deny the Certificate of Need and affect a plant shutdown. Therefore, if at any point of the license renewal process it becomes evident that a solution to the high level waste issue is not likely, NSP may well decide that we will not pursue license renewal or extend plant life.

The Minnesota Public Utilities Commission recently granted a limited Certificate of Need for a spent fuel storage facility at Prairie Island. The Public Utilities Commission allowed only enough storage to permit unrestricted operation of the plant until about 2005, precisely to require a Certificate of Need process which could examine the high level waste issue at future time. It is significant to note that the Minnesota legislature, during the 1993 session, is expected to review the authority currently granted to the Minnesota Public Utility Commission over spent fuel storage additions at nuclear facilities in Minnesota. The result could be a requirement to obtain legislative permission in order to add spent fuel storage capacity at the nuclear plants, or even a reversal of the Minnesota Public Utility Commission approval, forcing premature closing of Prairie Island.

On the low level waste front, the trouble that the state compacts are experiencing and resulting increases in low level waste burial costs at existing facilities stands to significantly increase our operations and maintenance costs and ultimately, decommissioning costs.

License Renewal Regulatory Process Issues

As cited in the introduction, a number of differences have been identified between the NRC staff's interpretation of the Commission's intent and NSP's interpretation. In addition, several areas require additional clarification of the Commission's intent. These items which will be discussed below, include:

1) New vs. Renewed License - Does the fact that a renewed license supersedes the current license (i.e., is a "new" license) serve as justification, in and of itself, for certain regulatory interpretations (e.g., expanded scope of the technical specification limiting condition for operation criteria and accelerated schedules for closure of certain issues) which are being promulgated by the staff?

2) Maintaining the Current Licensing Basis - What was intended under the principles of the license renewal rule? What "other issues" related to safety outside of age-related degradation unique to license renewal can be introduced by the staff? In support of the finding that the current licensing basis is being maintained, was it the Commission's intent? a) For licensees to demonstrate via the methods already accepted under the current licensing basis that the already established limits would continue to be met during the extended period of operation, or b) For licensees to demonstrate that the design and the margins in that design are being maintained. The methods and limits should be acceptable because the regulatory oversight process is continually being implemented whether licensees are operating under the initial or renewed license.

3) Age Related Degradation Unique to License Renewal - Is the definition of age related degradation unique to license renewal intended to limit the necessary reviews to those aging mechanisms and their effects which have not already been considered under the current licensing basis?

4) Scope - Systems, Structures and Components Contained in the Technical Specification Limiting Conditions for Operation - Is it intended that any system named in or any system which fulfills a functional requirement identified in the Technical Specification Limiting Conditions for Operation be considered as important to license renewal? Or, in addition to being contained in the Limiting Conditions for Operation does it need to have a specific operability requirement associated with the safe operation of the unit to be considered "important to license renewal"?

5) Level of Detail Required In the Application - Is it the intent of the Commission that the level of detail contained in the License Renewal Application be consistent with Final Safety Analysis Reports for newer plants or, that contained in the Final Safety Analysis Report which formed the basis for the initial licensing of the facility?

6) Level of NRC Resources in Support of License Renewal Reviews and the Review Process - What is the appropriate level of resources for the NRC to have allocated to support the license renewal review process, and, what are the appropriate elements of the review process prior to submittal of the application?

New vs. Renewed License

During promulgation of the final rule, industry did not challenge the NRC's decision that the renewed license should take the form of a new license which would supersede the current license. It was not viewed as important to contest whether the Atomic Energy Act allowed renewal by license amendment or if it required a "new" license, because in either event Sections 103 and 182 of the Atomic Energy Act grant the Commission the latitude to determine what is necessary to satisfy its basic responsibilities, (i.e., public health and safety are

adequately protected). Accordingly, it was felt that the proper focus of our energies was in dealing with the specific technical requirements, rather than on the form of renewal. Put another way, it was because the technical requirements of the license renewal proceeding would be decided on their own merit and not as a result of the decision of which administrative process (amendment vs. new license) was used.

Over the course of the last year, the fact that a renewed license is de facto a new license has been cited by the staff as the reason for certain regulatory and technical decisions. For example, the following question was posed to the staff seeking clarification about the requirement for including all systems subject to operability requirements in the facility technical specifications. Is any system named in or any system that performs a functional requirement identified in the Technical Specification Limiting Conditions for Operation required to be considered important to license renewal, if there is no corresponding operability requirement, or, the corresponding operability requirement does not have any impact on the safe operation of the plant (i.e., design basis events)?

The response given by the NRC staff was that the Commission had intentionally structured the renewal process as a "new" license signaling - - that like an initial license proceeding, it was not limited to reviewing just those things relevant to safety. Therefore, any system identified in the Technical Specification Limiting Conditions for Operation, regardless of its impact on safety, would be considered "important to license renewal". A later section of this paper will address the specific concerns related to the systems added by this interpretation.

A second example occurred during discussions of the draft fatigue Branch Technical Position for license renewal before the Advisory Committee on Reactor Safeguards (ACRS). In responding to the question of why the NRC staff had to address fatigue as part of license renewal as opposed to letting the code consensus

and normal regulatory processes run their course, the NRC staff responded: "The question that I think is more pertinent to the discussion is whether or not the Commission could issue a new license without addressing issues such as fatigue or environmental qualification of electrical equipment, et cetera. I would not want anybody to think that that's necessarily the case where we could say, well, we're going to grant a new license, but we'll catch these other things as part of the process. That does not seem to make sense to me." (Emphasis added.)(Page 233, Transcripts, ACRS, Joint Meeting of the Subcommittees, July 7, 1992)

In the case of the fatigue issue, Generic Safety Issue Number 78, is currently under NRC staff review as part of the normal regulatory oversight cited by the license renewal rulemaking. It is also under review of the American Society of Mechanical Engineers' code consensus process. The staff is using the "new" license as a reason why this and other issues (e.g., environmental qualification) cannot be allowed to progress through the normal processes.

Under the authority given the NRC by the Atomic Energy Act, NRC has the responsibility to establish a process for renewing a license as it sees fit to ensure that the public health and safety is adequately protected. In both examples cited above, it is within the Commission's purview to structure the requirements that it deems necessary and sufficient to assure public health and safety, without regard to the method of licensing (i.e., new license or amendment). The decision on the scope of license renewal and need to accelerate the resolution of issues should be evaluated on their own merit. The fact that a renewed license is a "new" license should not in and of itself introduce any additional minimum technical or regulatory requirements.

Maintaining the Current Licensing Basis (CLB)

The standard for issuance of a renewed license is contained in 10 CFR Part 54, Section 54.29(a), which states: "Actions have been identified and have been or will be taken with respect to age-related degradation unique to license renewal of SSCs important to license renewal, such that there is reasonable assurance that the activities authorized by the renewed license will be conducted in accordance with the current licensing basis, ...". Put more simply, aging must be managed such that the current licensing basis is maintained.

The framework for structuring the finding in this way is provided by the first principle of the final license renewal rule which is, "... that, with exception of age-related degradation unique to license renewal and possibly some few other issues related to safety only during extended operation, the regulatory process is adequate to ensure that the licensing bases of all currently operating plants provide and maintain an acceptable level of safety for operation so that operation will not be inimical to public health and safety or common defense and security." (SOC at 64946)[2]

The NRC staff has suggested that the finding of adequacy contained in the first principle was limited solely to the regulatory oversight process. They further contend that the words, "some few other issues" referred to in the first principle are evidence that the Commission specifically envisioned certain issues which should be re-examined under the license renewal process. The two issues cited were environmental qualification and fatigue. (Page 27, Transcripts, ACRS, Joint Plant License Renewal/Reliability and Quality Meeting on Branch Technical Position, September 16, 1992) The NRC staff has also stated that as other issues are identified, they will be brought forward to be re-examined.

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[2] The statements of considerations for the proposed and final license renewal rules are published in the Federal Register at 55 Fed. Reg. 29043 (July 17, 1990) and 56 Fed. Reg. 64943 (December 13, 1991) respectively. They are hereafter cited as "SOC at ____".

The interpretation forwarded by the staff ignores the words which follow the finding of adequacy on the regulatory oversight process, which continue, "... to ensure that the licensing bases of all currently operating plants provide and maintain an acceptable level of safety ..." Earlier proposed versions of the license renewal rule went further and recommended to the Commission tnat not only should the regulatory process be found adequate but that the current licensing bases for all operating plants be found adequate as part of the rulemaking. A specific finding on each plant's current licensing basis was not adopted because of the unique nature of each facilities' license and a concern that a broad finding of adequacy would be challenged by opponents and tie the rule up unnecessarily. However, it did serve to point out that, other than plant specific nuances, the current licensing bases derived from the current regulations, in total, are an excellent measure of a plant's safety now and in future operations.

From our review of the Statement of Considerations and all work leading up to the final license renewal rule we would conclude that the finding in the first principle, that the regulatory oversight process is adequate and ensures that the current licensing basis provides an acceptable level of safety, was intended to protect against exactly what the NRC staff is attempting to do: Re-introducing previously examined issues. It should not be used in this way. Rather, it should be used as intended, as the already established basis for evaluating the plants for license renewal.

With regard to the specific issues of fatigue and environmental qualification and whether they were specifically envisioned for re-examination as, "other issues", a simple reading of the first principle would yield that the phrase, "other issues" refers to something other than age-related degradation unique to license renewal. The SOC at 64954 states: "As a plant ages, a variety of aging mechanisms are operative. They include fatigue, .." and, "Alternatively, degradation may have been analyzed, evaluated and acted on in the original design for only 40 years (as

is generally the case, for example, with fatigue and environmental qualification of equipment). Such situations must be analyzed for the period of extended operation as a basis for determining any additional aging management actions that may be required for license renewal." These statements lead one to conclude that both fatigue and environmental qualification are considered as age-related degradation unique to license renewal and not included as "other issues".

In reviewing the issues of fatigue and environmental qualification as age-related degradation unique to license renewal, it seems appropriate to address the other issue under the broader heading of the current licensing basis; What does it mean to maintain the current licensing basis? Does the design and its margins need to be maintained, or, the code limits established by regulations or consensus codes. This is most easily done by looking at the specific issues of fatigue and environmental qualification of equipment.

The staff, in promulgating its position on fatigue, has stated: "...the staff's approval of an operating license was based on a design, the margins in that design, defined by an analysis which demonstrated a component was acceptable for 40 years, supplemented by the other operational inspections, et cetera, required by tech specs and other operating programs. (New Paragraph) The maintenance of the current licensing basis is one of the fundamental principles of the license renewal rule." (Page 479, Transcripts, ACRS, Full ACRS Meeting, July 9, 1992)

Two aspects of the stated staff position are troubling. First, by citing "the margins in that design" as a separate element of the current licensing basis the staff infers that in order to make a demonstration that the current licensing basis is maintained, a licensee must show that no elements of the design code itself are impacted by aging. Second, it elevates the analysis itself to be on par with the current licensing basis. The definition of the current licensing basis in the rule

does not include the analyses which are maintained as a part of the design records unless the analyses were docketed and resulted in a commitment to the NRC. Licensees are not required to maintain the margins to the code limits unless specific commitments have been put in place to do so.

In addition to these issues, the staff is seeking to impose an upgrade from ANSI B31.1, which was utilized on older plants for piping designs to ASME Section III type fatigue analyses and even further to incorporate environmental effects on fatigue which have not been previously imposed on any operating plant to date. The entire approach deviates from the premise that the current licensing basis provides an acceptable level of safety.

In accordance with its current licensing basis, Monticello would utilize the following approach. For Monticello, fatigue was addressed by designing to ANSI B31.1. ANSI B31.1 utilized a stress reduction factor, if the component was going to exceed 7000 thermal cycles, to account for fatigue. In accordance with the license renewal rule, this licensing basis is required to be continued into the extended period of operation. We recognize and agree that we must demonstrate that we will remain below the 7000 thermal cycle limit or apply stress reduction factors during the extended period of operation. This should be reported in the license renewal application to a similar level of detail as was required in the initial license application. This would ensure the same level of safety is provided during the extended period of operation as is currently being provided with the same reasonable assurance. In addition to the design considerations incorporated for fatigue by ANSI B31.1 or ASME Section III, these components are subject to ongoing inspections requirements under ASME Section XI. ASME Section XI also provides the methods for evaluating and correcting detected flaws.

With regard to the environmental qualification of equipment, the basis for the NRC staff's position is captured by the following statement: "The question of the

licensing basis is an interesting one, because the current licensing basis expires at year 40. So, the qualification programs of that license would expire at year 40." (Page 26, Transcripts, ACRS, Joint Plant License Renewal/Reliability and Quality Meeting on Branch Technical Position, September 16, 1992) This position is inconsistent with the license renewal rule which contemplates maintaining the current licensing basis. The current licensing basis does not expire.

It is true that the existing qualification of many components was not carried beyond 40 years. This was not because the methods approved under the current licensing basis, IEEE-323 (1971) for DOR Guideline plants and IEEE-323 (1974) for newer plants, could not have achieved qualification for longer periods. Rather, it is only because there was no reason to extend qualification beyond the 40 year license expiration date.

Utilizing the methods currently allowed under the licensing basis for qualification, it is possible for some components to extend the qualification period out to 60 years and beyond. The position forwarded by the NRC staff is inconsistent with the principles of the license renewal rule and the rule itself. The second principle of the rule states: "... the plant-specific licensing basis must be maintained during the renewal term in the same manner and to the same extent as during the original licensing term." (SOC at 64953) 10 CFR Part 54, Section 54.33(e) requires: "The licensing basis for the renewed license includes the current licensing basis, as defined in 54.3(a);..." In accordance with the rule, licensees are required to carry the current licensing bases forward. This includes the environmental qualification of equipment and the methods allowed to demonstrate that qualification.

Age-Related Degradation Unique to License Renewal

During promulgation of the license renewal rule, the version proposed in July, 1990 introduced in 10 CFR Part 2, Section 2.758 the term, "age-related degradation unique to license renewal". At that time no definition of the specific term was offered. The intent of introducing this term in 10 CFR Part 2, Section 2.758 was to limit those challenges to the license renewal rule to those issues which were unique to license renewal, or put another way, were not already addressed under the activities of the current license.

In finalizing the license renewal rule it was determined that the treatment of age-related degradation in 10 CFR Part 54 was not limited under the proposed rule. To make it consistent with the proposed 10 CFR Part 2, Section 2.758, the treatment of age-related degradation in Part 54 was modified to age-related degradation unique to license renewal and the current definition was added. However, the current definition does not seem to match with the originally proposed intent of the term. The current definition, as contained in the final rule does not allow any age-related degradation to be found as not unique to license renewal. The "or" criteria between each of the individual elements of the definition requires that all three elements be demonstrated before an age-related degradation mechanism can be found as not unique. In addition, a literal interpretation of the individual elements makes it difficult to meet even one of the three.

At this time, NSP in preparing its application has not applied the definition of age-related degradation unique to license renewal. It has structured its determination bases on "potential significance" of a degradation mechanism to challenge the ability of a component to perform a required function. This determination is conservative and results in a much larger set of degradation mechanisms being brought under the scope of the license renewal review. It is

larger, because, it does not allow mechanisms previously dispositioned under the current licensing basis to be excluded. It is also larger, because, under the first element of the Part 54 definition, any mechanism which occurs during the term of the current license but whose effects may be different in character or magnitude after the term of the current license, without any credit for mitigating measures (such as replacement) must be considered unique. Different in character and magnitude is vague and can be broadly interpreted. Because of a concern over challenges to this term it is being very conservatively applied.

In attempts to clarify the Commission's intent, various interpretations have been discussed with the staff by industry. Similar to our own attempts to apply the definition, the NRC staff has opted to take a conservative, literal interpretation which limits the use of this definition. If the Commission's intent was to limit age-related degradation considered under license renewal to that not considered adequately under the current license, clarifying guidance needs to be issued, or alternatively, the language of the definition changed.

Scope - Tech Spec LCO Criteria

Previously, under the New vs. Renewed License section of this paper the interpretation of the fourth criteria of definition of Systems, Structures, and Components (SSCs) Important to License Renewal was discussed. That criteria requires: "All systems and structures subject to operability requirements contained in the limiting conditions for operation" be included under the scope of license renewal. The SOC at 64955 expands on this criteria to mean: "The Commission is not restricting the definition of SSCs important to license renewal to any particular mode of operation and considers equipment operability in all modes of operation to be equally important in defining SSCs important to license renewal. (New Paragraph) In sum, the Commission defines the scope of this portion of the definition of SSCs important to license renewal to include all systems or

components necessary for operation in any mode of plant operation that has operability requirements in the plant technical specifications limiting conditions for operation. This includes (1) all systems....specifically identified in the technical specification limiting conditions for operation, (2) all systems...for which a functional requirement is specifically identified...(3) any necessary supporting system..."(Emphasis added) The NRC staff has interpreted the words, "any mode of plant operation..., all systems specifically identified..., and all systems for which a functional requirement is specifically identified...," to include all aspects of facility operation, including radwaste processing and components such as sealed sources.

The operability requirements for these types of systems do not deal with the safe operation of the power producing SSCs of the plant. Rather, the operability requirements of these systems are linked to other portions of the Code of Federal Regulations, such as 10 CFR Part 20. The inoperability of these systems does not result in shutdown of reactor or its auxiliary systems. It only results in restricted use of these systems or components as self-contained entities until repaired. When asked why these types of systems, which have no impact on safe plant operation, were being required, the NRC staff responded that the Commission had intentionally structured the renewal process as a "new" license signaling, that like an initial license proceeding, it was not limited to reviewing just those things relevant to safety.

This response fails to consider the additional guidance contained in the statement of considerations which states: "Thus SSCs important to renewal would include those relied on to remain functional during design basis events, including conditions of normal operation, anticipated operational occurrences, design basis accidents, external events, and natural phenomenon for which the plant was designed." (SOC at 64955) It is clear that the Commission intended to include those systems which deal with design basis events. Systems such as radwaste and

sealed sources are not designed in accordance with any specified design basis events.

It further amplified on its intent by stating: "The Commission expects licensees to apply the same regulatory practice with respect to operability for purposes of determining SSCs important to license renewal." (SOC at 64955) In making operability determinations, not every system specifically identified or for which a functional requirement is specifically identified in the technical specification limiting conditions for operation results in an operability determination leading to plant shutdown. We believe that the Commission's intent here was to have a subset of those systems which are contained in the technical specification limiting conditions for operation, which in addition to being specifically identified, had operability requirements directly affecting the safe operation of the reactor and its auxiliary systems. Any more conservative interpretation of this criteria results in systems and structures being included as important to license renewal which have no impact on reactor safety (i.e., prevention or mitigation of Design Basis Events).

Level of Detail

Over the course of developing the Monticello license renewal application, it has been NSP's intention to provide a level of detail similar to that contained in the Final Safety Analysis Report which contains the initial licensing basis for the plant. The Final Safety Analysis Report continues to be updated in accordance with 10 CFR Part 50, Section 50.71 and to date has been found as an acceptable level of detail to capture the essence of the licensing basis for Monticello. We believe this to be an appropriate level of detail for a license renewal application.

As we have interacted with the staff regarding the preparation of our application, the draft Standard Review Plan and Industry Reports, we have become concerned that the expectations of the level of detail necessary to satisfy the license renewal

requirements is far in excess of that necessary to provide reasonable assurance of safety. In these interactions, specific component evaluations, including identification of individual mechanisms, acceptance criteria and corrective actions have been specified or requested as part of the documented evaluations. The Commission should keep in mind that for Monticello, at this time some 107 systems, representing over 14,000 components are required to be evaluated under the Integrated Plant Assessment. Introduction of this level of detail into the license renewal application will tie up NRC and licensee resources unnecessarily.

The Industry Reports and Monticello license renewal application have been prepared utilizing similar approaches and levels of reporting the results of the required evaluations. We believe that, similar to the initial license review, this level of detail should prove adequate for most issues. Where concerns exist or additional information is required, specific information requests and responses can be docketed. Much of the information is available in backup documentation and should be accessed by site visits, audits and inspections. We urge the Commission to pay careful attention to the development of the Regulatory Guide on Format and Content, the Standard Review Plan and Industry Report Safety Evaluation Reports to ensure that only that information which is necessary to provide reasonable assurance of safety be required for submittal with the license renewal application, using the precedence of the initial licensing reviews as a guideline. Until such time that the first applications have been reviewed to provide a sufficient base of knowledge on the license renewal process the Standard Review Plan and Regulatory Guidance documents should be left in draft form to allow lessons learned to be incorporated without needing to change already established staff positions.

NRC Resources and Review

Over the course of the last year, NSP has become concerned with lack of resources being applied by the NRC in the area of license renewal. The License Renewal Directorate has been cooperative in attempting to establish meetings, but more often than not it efforts were diverted to activities necessary to support the license renewal technical or environmental rulemakings. In addition, this situation was made worse by the temporary assignment of individuals from license renewal responsibilities to work on the Advanced Light Water Reactor Program. This has resulted in a lack of meaningful interaction between NSP and the staff, as well as a general lack of progress in the area of Safety Evaluation Reports on Industry Reports. The staff seems to be waiting for the submittal of the first application before committing adequate resources to this important area. Our concern is that the staff needs to apply ample resources now during the development stages of this process, to ensure quality interaction between the staff and the industry, as well as the ability to provide the necessary regulatory guidance. During this time period while Monticello's application is on hold, we would encourage the NRC staff to complete its work on those generic areas such as the Regulatory Guidance, Standard Review Plan and Industry Reports, as well as undertaking, meaningful interactions with Monticello, the Babcock & Wilcox Owners' Group and other licensees moving forward with license renewal programs.

Effect of Issues on the License Renewal Decision

The most significant effect of the issues described above is a general concern that entering into the license renewal process, without absolute recognition that the current licensing basis provides an acceptable level of safety, may result in unwarranted challenges to the existing operating license. The acceptability of the current licensing basis must be firmly established and protected under the license renewal process.

While each of the individual concerns described above, is not necessarily a roadblock to license renewal, they together indicate a lack of recognition by the NRC staff that existing plants are known entities with safe operating records established for over 20 years at the time that they apply for renewal. Further, it should be recognized that the regulatory oversight process will continue into the renewal period and will provide ample opportunity for the NRC staff to address any new safety concerns that might arise. These facts should allow the license renewal process to be focussed on those narrow issues of aging that occur uniquely during the period of extended period of operation. It will be difficult to change the mind set from those of an initial license review to that of license renewal.

It is essential that the Commission and NRC Staff Executive Management actively participate in the license renewal arena as the process is developed. To that end, NSP would request following specific actions on the part of the Commission and NRC Staff Executive Management.

1) That the Commission provide policy level guidance clarifying the following points:

   a) Although license renewal is being accomplished by issuing a new license such issuance does not impose any minimum technical or regulatory requirements beyond those necessary to support the finding specified in 10 CFR Part 54, Section 54.29. Further, the fact that a renewal is being effected by a new license does not require that the scope of SSCs important to license renewal include SSCs beyond those necessary for the safe operation of the facility, nor, does it mean that certain issues which are being addressed under the current regulatory oversight process, such as fatigue and environmental qualification, need to be resolved outside of that process, for the purpose of issuing a renewed license.

b) The finding that the regulatory oversight process was adequate, thereby ensuring an acceptable level of safety provided by the current licensing basis, was intended to recognize the general acceptability of the regulations, codes and standards as well as the methods previously accepted for implementing them.

c) The definition of age-related degradation unique to license renewal was to limit considerations under license renewal to those aspects of aging not previously considered under the current licensing basis. Provide clarifying guidance of how to apply the existing definition consistent with that intent.

d) The technical specification limiting condition for operation criteria in the definition of SSCs important to license renewal was limited to those systems which dealt with design basis events as contained in the facility Updated Final Safety Analysis Report.

e) The level of detail to be provided in the license renewal application should be consistent with the Updated Final Safety Analysis Report and so reflected in the Regulatory Guidance Documents and Standard Review Plan.

2) That the NRC Staff Executive Management put in place adequate staff resources to support the development of Regulatory Guidance and Standard Review Plans consistent with the license renewal rule and supporting policy guidance, review of the Industry Reports, and pre-applicant interactions with NSP and other interested licensees so that a common understanding of the expectations of all parties is reached prior to the submittal of an actual license renewal application.

3) That a process be established, whereby, as issues arise through interactions between the NRC staff and licensees, access is readily available to NRC Staff Executive Management as well as the Commission to achieve timely resolutions.

AF05-1
PDR-05

POLICY ISSUE
(Notation Vote)

March 1, 1993 SECY-93-049

For: The Commissioners

From: James M. Taylor
Executive Director for Operations

Subject: IMPLEMENTATION OF 10 CFR PART 54, "REQUIREMENTS FOR RENEWAL OF OPERATING LICENSES FOR NUCLEAR POWER PLANTS"

Purpose: To inform the Commission of the outcome of the staff's senior management review of key license renewal issues and to obtain the Commission's approval of staff proposals for implementing the provisions of 10 CFR Part 54.

Summary: The staff discusses its review of significant license renewal issues that have been identified since 10 CFR Part 54 was promulgated. On the basis of its review, the staff concludes that a rule change is not needed to facilitate an effective and efficient renewal review process. The staff identifies a specific approach for carrying out the rule-required integrated plant assessment, which includes an initial broad scope of plant equipment but provides mechanisms to quickly focus on important equipment whose performance or condition could be negatively impacted by aging in the renewal term. The approach recognizes that both maintenance rule requirements and risk based methodologies can play a role in meeting license renewal requirements. Additionally, the staff identifies a resource-efficient approach for future staff review of industry reports sponsored by the Nuclear Management and Resources Council (NUMARC); which is intended to utilize areas of technical agreement between NUMARC and the staff. Specific recommendations are presented to establish Commission-approved positions on key license renewal issues.

NOTE: TO BE MADE PUBLICLY AVAILABLE ON MARCH 3 1993

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Background: In 1989, the Commission published an advanced notice of proposed rulemaking for license renewal and published the proposed rule in the summer of 1990. In December 1990, the staff published a draft regulatory guide and a draft standard review plan (SRP), which were both based on the proposed rule.

The final rule was published in December 1991 and became effective in January 1992. The final rule included some significant changes from the proposed rule such as (1) a reliance on the regulatory process to ensure that, except for renewal-term aging issues which the regulatory process was determined not to address explicitly, the licensing bases for each plant provide and maintain an acceptable level of safety; (2) the addition of a definition of age-related degradation unique to license renewal (ARDUTLR); (3) changes to the definition of equipment important to license renewal; and (4) revision of the integrated plant assessment (IPA) to no longer include compilation and explicit review of the current licensing bases (CLBs).

Since publishing the final rule, the staff has been conducting various activities for implementing the license renewal rule implementation. These actions have included revising the regulatory guide and SRP, interacting with the lead plant licensees, and reviewing industry technical reports sponsored by NUMARC. Over the past year, a number of significant policy issues have been identified.

On December 7, 8, and 18, 1992, the staff briefed the Commission on the status of the various license renewal activities and on the staff's plans to resolve key license renewal issues. The staff informed the Commission that a senior management review group would address these issues. The staff also stated that it would interact with NUMARC in public meetings to obtain the industry's views. In a staff requirements memorandum of December 21, 1992, the Commission endorsed the staff's senior management review, identified a number of issues for consideration by the group, and directed the staff to submit its recommendations to the Commission.

Discussion: The senior management group has reviewed the following issues identified over the past year: (1) effective and efficient implementation of the IPA screening requirements, (2) the question of whether the maintenance and license renewal rules can be integrated further, (3) the appropriate scope of the license renewal rule, (4) the appropriate interpretation of ARDUTLR, (5) the role of risk-based methodologies in the IPA, (6) the appropriate level of detail required in an application and in updates required by the

rule, (7) the question of whether issues pertaining to fatigue and the environmental qualification of electrical equipment (EQ) for older plants should be evaluated for license renewal or as a current generic safety issue, and (8) the question of whether the form of a renewed license affects the technical requirements for license renewal.

The staff began its review by focusing broadly on the overall principles and objectives of the rule. The staff reaffirmed the rule's two key principles as well as the appropriateness of the current focus of what must be examined before a renewed license is issued. Specifically, except for NEPA environmental requirements and absent special circumstances, the issue for license renewal is the effective management of aging effects on the performance or condition of important plant equipment during the renewal term. The staff's proposed approach focuses on effective programs rather than the identification of aging that is or is not unique to the renewal term. Additionally, the approach builds on the judgement that performance and condition monitoring of plant equipment can be relied upon to demonstrate that aging effects, including potential effects in the renewal term, are being effectively managed.

Further, the staff concluded that the rule appropriately recognizes that, except for mitigating the effects of ARDUTLR, the existing NRC regulatory oversight process is adequate and will continue to ensure that each plant's licensing bases provides an acceptable level of safety. Before new requirements are established, the regulatory process requires the NRC staff to evaluate the safety significance of the requirements pursuant to the backfit provisions of 10 CFR 50.109.

The staff's review and conclusions for key license renewal issues are discussed below.

Integrated Plant Assessment

The rule requires each applicant for license renewal to perform an IPA to demonstrate that plant systems, structures, and components (SSCs) that are important to license renewal (ITLR) have been identified and that, for those components subject to ARDUTLR, ARDUTLR will be adequately managed. Recognizing that the IPA is the central action required to implement the rule, the staff focused on identifying an effective and efficient IPA approach.

The specific details identified by the staff for implementing the IPA, and described in the following, are based on a review philosophy which requires initial consideration of

the entire plant to identify those SSCs defined by the rule as ITLR. Furthermore the approach provides mechanisms to quickly focus on equipment that may require new or enhanced programs to manage aging in the renewal term. The enclosure provides a discussion and flow path description of the staff's IPA approach.

Under this approach all SSCs currently defined as ITLR, including those subject to operability requirements contained in facility technical specification limiting conditions for operation (TS LCOs), would be identified and would be subject to further evaluation within the IPA. Although the staff considered the possibility of narrowing the ITLR scope (e.g., to focus only on TS LCOs which include SSCs necessary to mitigate design basis events) it concluded that (1) a rule change would be required to change the rule's specified scope, (2) the existing ITLR scope is consistent with the rule's philosophy that the applicant should consider equipment within a large initial scope in the license renewal process, and (3) SSCs that are currently included in TS LCOs but are not safety significant can be removed from the TS in advance of license renewal.

The next step in the IPA provides for eliminating parts of systems or structures that are not required to support the ITLR function of the previously identified equipment.

The proposed IPA next determines whether age-related degradation (ARD) is not unique or whether it could be unique. The staff believes that most structures and components (SCs) could be subject to age-related degradation that is unique to license renewal and would therefore not be screened out of the IPA at this step. This is consistent with both the IPA requirement to identify SCs that could have any ARDUTLR and the definition of ARDUTLR which includes aging whose effects were not explicitly evaluated by the applicant and approved by the NRC for the renewal term. Although some long-lived ITLR equipment might be identified by the applicant as not being subject to ARDUTLR, a demonstration that this equipment could not have ARDUTLR would require a detailed justification by structure- or component-specific inspection and/or analysis.

Relatively short-lived equipment that is replaced at a fixed interval could also be identified as not subject to ARDUTLR. Such identification would, however, require an applicant to provide detailed SC-specific justification in the application. The staff expects that the justification for conclusions that such equipment has no ARDUTLR will be based on commitments for continuing licensee action to periodically replace the equipment. As provided in 10 CFR 54.33(b), the

staff can include license conditions and technical specifications as necessary to ensure that licensee actions will be continued so that equipment will not experience ARDUTLR. In determining whether or not technical specifications or license conditions are necessary, the staff will consider such factors as safety significance, the nature of administrative controls on commitments and changes to commitments, and reporting requirements.

The staff concluded that the disadvantages of justifying that SCs are not subject to ARDUTLR, particularly short-lived SCs covered by periodic replacement programs, are not offset by an advantage of screening out early in the IPA and most SCs would not be dispositioned by such a justification. Additionally, the staff concluded that, since such justifications would need to be detailed and might be based on continuing programs, the time and resources required for hearings would not be significantly different from the time and resources needed for hearings related to effective program justifications. As discussed below, the staff concluded that, for most SCs, effective programs could be demonstrated more effectively and efficiently and would provide greater flexibility for future program changes than "no ARDUTLR" justifications. Accordingly, the staff focused on an implementation approach that would provide a permissible alternative to the detailed component-by-component justification.

If few SCs are screened out due to "not ARDUTLR," subsequent screening should be focused upon demonstrating that a significant majority of SCs are already included in effective programs and can be dispositioned with minimum documentation submitted in the application. The staff believes that an effective program can be demonstrated with minimum documentation if the SC is; (1) covered by regulation or the facility's technical specifications, with specified acceptance criteria for performance or condition and (2) is in the maintenance rule scope and requirements. As a result of meeting these stipulations, this equipment would be (1) subject to either performance- or condition-related acceptance criteria as a condition of the license or regulation and (2) covered by requirements for root-cause analysis and follow-on corrective action, enhanced monitoring, or both in the event of maintenance preventable failure. For such components this could result in programs with acceptance criteria and monitoring and corrective action requirements that assure conformance with the CLB throughout the renewal term.

This approach is valid if the required surveillance activity is sufficient to detect, in a timely manner, ARD effects on performance or condition. If the required sur-

veillance activity tests the function or condition of the component sufficient to assure the component's capability to perform its safety function and comply with the CLB (e.g., Emergency Diesel Surveillance Testing) then this approach is valid. The staff's judgement is that this will be the case for many SCs because the technical specifications already include explicit performance and condition surveillance acceptance criteria, which assure compliance with the CLB. It is possible that some surveillance tests may be partially sufficient. In such cases, the applicant would need to address those aspects of performance or condition which are not covered by currently required surveillance. This IPA approach recognizes that performance or condition monitoring can be relied upon to demonstrate that aging effects are being effectively managed and controlled.

Whether an applicant chooses to disposition an SC under "not unique" to license renewal or under "effective program" the staff will review the applicants justification for either disposition. This review will consider that the rule calls for an explicit identification and evaluation of ARD effects to justify dispositioning at the "not unique" phase.

SCs included in existing programs but not addressed by technical specification or by regulation, as discussed above, may also be found to already be subject to effective programs for license renewal. However, the applicant would be required to provide additional justification in the application. This additional information would demonstrate that the existing programs, including performance or condition monitoring programs established under the maintenance rule (MR), meet the requirements of effective programs prescribed by 10 CFR Part 54.

While the MR does not require such information to be submitted for evaluation to the NRC, it would be required in a license renewal application to support an agency finding that the standards for issuance of a renewed license, 10 CFR 54.29, have been met.

New programs determined to be needed for certain SCs would also require additional information beyond the summary information described above. Alternatively, the applicant could justify that no actions are required because the performance or condition of the SC and compliance with the CLB are not affected by age-related degradation.

No changes to the rule are needed to facilitate this IPA approach.

The enclosure provides additional information for performing the IPA.

Integration of Maintenance and License Renewal Rules

Although different in some respects, the MR and the license renewal rule (LRR) share a fundamentally similar objective and scope. The objective of both rules is to ensure that the effects of age-related degradation on the performance or condition of important plant equipment are adequately mitigated; the specific focus of the maintenance rule - maintenance preventable failures - essentially encompasses all forms of age-related degradation. Although the maintenance rule 10 CFR 50.65(a)(1) calls for performance goals to be set, the rule does not prescribe specific goals, rather the methods for establishing goals are described in the draft NUMARC guidelines endorsed by the NRC draft regulatory guide (RG). Similarly the maintenance rule 10 CFR 50.65(a)(2) does not require goals if preventive maintenance is effective, with effectiveness defined in the draft NUMARC guidelines. The scope of equipment covered by the rules is similar with a somewhat broader scope (e.g., non-safety-related equipment that is included in plant emergency operating procedures) covered by the MR. Additionally, although, the scopes of the two rules are not identical, the somewhat broader scope of the MR serves to facilitate the proposed IPA approach, since most ITLR equipment will be covered by the MR requirements.

The IPA approach described above, which would screen a large majority of SSCs as currently included in effective programs, recognizes the similarities of the two rules. The approach relies, in part, on MR results-oriented requirements to assess the effectiveness of maintenance activities. The MR requires licensees to monitor the condition or performance of applicable SSCs against goals established by the licensee. Where goals are not met, licensees are required to take corrective actions. Where preventive maintenance has been demonstrated effective through the absence of failures or unacceptable degradation in performance or condition, formal goal-setting, monitoring, and corrective action are not explicitly required.

Together, maintenance rule programs and NRC previously approved acceptance criteria (i.e., in regulation or within facility technical specifications) provide an efficient mechanism for identifying existing programs which are "effective" under the LRR. In order to establish effectiveness, the acceptance criteria established under technical specification or regulation, and the performance goals, monitoring, preventive maintenance and corrective actions

established under the maintenance rule, must in combination assure compliance with the CLB during the license renewal period. Using this approach, a large majority of equipment would be expected to be dispositioned on the basis of the effectiveness of programs. This IPA approach is viewed as an integration of the two rules. Under this approach the emphasis for implementing license renewal and the MR will be essentially the same (i.e., effectiveness of programs) and will not be focused principally on potential uniqueness of aging in the renewal term.

The staff noted that although the MR requirements are not effective until 1996, many licensees will begin implementing the maintenance rule in 1993-94 and all licensees are expected to be in full compliance by July 1996. Given the current schedules for plant-specific renewal applications, this approach of integrating the maintenance and license renewal rules is appropriate. No changes to either rule are required to implement this proposed approach.

Role of Risk-Based Methodologies

Although the IPA methodology adopted in the rule is based on a deterministic approach, the Commission recognized that probabilistic risk assessment (PRA) can be useful for achieving the aging-mitigation goals of license renewal. The Commission concluded that PRA could be used to supplement the IPA process to further ensure that important equipment is identified for the license renewal review.

Relying partly on maintenance activities and MR requirements, the proposed IPA approach recognizes that risk significance is expected to be a key factor in implementing MR requirements. The draft MR regulatory guide that endorses NUMARC guidelines emphasizes the use of risk insights in (1) determining the equipment for which goals and monitoring are established under 10 CFR 50.65(a)(1) and (2) establishing appropriate performance criteria for preventive maintenance programs under 10 CFR 50.65(a)(2).

Accordingly, the staff expects that in implementing the MR, licensees will consider insights from plant-specific PRAs, including the results of individual plant examination programs and reliability-based maintenance assessments. As a result, risk methodologies will play a key role in implementing the maintenance rule and an indirect role in implementing the LRR requirements. However, use of PRAs will be more limited under the renewal rule. Specifically, use of PRAs cannot excuse nonconformance with the CLB or development of an effective program to assure CLB compliance during the renewal term.

Level of Detail and Reporting Requirements

The staff recently noted industry concerns regarding the level of detail needed in the supplemental final safety analysis report (SFSAR) application for license renewal. In addition to requiring information on effective programs and IPA methodology, the rule requires that the SFSAR application include a list of all SSCs determined to be important to license renewal (ITLR). Section 54.37 of the rule also requires an annual update to the SFSAR, including any newly identified or deleted ITLR SSCs and

> ...a list of all changes made to programs for management of age-related degradation unique to license renewal that do not decrease the effectiveness of programs to which the licensee committed and a brief description, including a summary of the safety evaluation of each change.

The staff understands that the industry has the following principal concerns regarding these requirements: (1) SSCs contained in the SFSAR list could become newly subject to the requirements of 10 CFR 50.71(e), (2) a detailed listing of each ITLR structure and component would result in a voluminous SFSAR application and is inconsistent with the level of detail contained in the initial FSAR and supplements, and (3) the requirement for annual reporting of all changes to effective programs would be an unwarranted administrative burden.

The staff believes that these concerns can be adequately addressed without changing the rule. For example, the reporting requirements of 10 CFR 50.71(e) are consistent with the requirements of 10 CFR 54.37(b) as they apply to additions and deletions from the list of SSCs ITLR. Additionally, the ITLR SSC listing can be accomplished by grouping SSCs (e.g., by function). The staff does not envision a list that includes the identity of each component (such as each containment penetration with identification number).

The staff believes that the annual reporting requirements of 10 CFR 54.37(c) should not place an unwarranted burden on renewal licensees. The requirements of the rule require a safety evaluation summary of such changes and are explicitly focused on changes to specific commitments made in the renewal application. Since, for many SCs, programs already required by regulation or technical specification will be used to support the demonstration of effective programs in the application, the safety rationale supporting any license amendments related to these programs will also support reports required by 10 CFR 54.37(c).

Fatigue and Environmental Qualification of Electrical Equipment

While preparing the implementation guidance for license renewal in the SRP, the staff found several significant issues related to fatigue resistance and environmental qualification of electrical equipment (EQ). A key aspect of the issues related to both fatigue and EQ was whether the licensing bases, particularly for older plants whose licensing bases differ from newer ones, should be reassessed or enhanced in connection with license renewal or whether they should be reassessed for the current license term.

The staff reexamined and reaffirmed that the current licensing basis is carried forward into the renewal period and that the NRC's regulatory processes will provide assurance that, except for ARDUTLR, the CLB will be maintained throughout the renewal term. The staff's regulatory processes require that potential generic issues, such as fatigue and EQ, be evaluated for backfit in accordance with 10 CFR 50.109. Where a facility's current licensing bases includes time-dependent elements, some additional analyses and/or actions may be needed to demonstrate that the CLB requirements continue to be satisfied in the renewal term.

As a result of its evaluation of the technical adequacy of fatigue and EQ requirements for renewal in 1992, the staff identified generic issues that should be evaluated for backfit during the current license term. The staff is developing interoffice action plans to address upgrading fatigue and EQ requirements for older plants. These plans will integrate ongoing research and licensing reviews to ensure timely resolution.

Form of Renewal License

The staff reviewed the form of the renewal license (i.e., a new license or an amendment to the current operating license) and its impact on technical requirements for license renewal. The staff has reaffirmed the position that the form of the license does not affect the scope of the technical issues to be reviewed or the safety evaluations required to be performed. The scope and criteria of the staff's review for license renewal and the scope of license renewal hearings are unaffected by the rule's stipulation that a renewed, rather than an amended, license be issued in connection with NRC authorization for extended operation. Neither the rule nor staff activities in developing regulatory guidance presume that the form of the renewal license affects what is technically necessary for license renewal.

NUMARC Sponsored Industry Reports

The staff reviewed the status of the NUMARC-sponsored industry reports (IRs). Ten IRs address aging issues associated with specific structures and systems, and one IR on IPA screening methodology. The original intent of the IRs for specific structures and systems was to serve as a referenceable surrogate for carrying out the IPA requirements of the license renewal rule. The staff has been reviewing the IRs to develop safety evaluation reports (SERs).

To best use the technical information and agreements from the NUMARC program, the staff plans to follow a new approach for handling the IRs. Instead of writing an SER for each IR, the staff plans to incorporate appropriate technical information from the IRs into the draft SRP for license renewal. This approach is expected to result in a single document that will include IR insights and establish the staff's review acceptance criteria. It is also expected to result in more efficient use of staff resources.

Conclusions: The staff's conclusions are the following:

1. The license renewal rule does not need to be changed. The rule, including its two key principles, is logical and practical, and provides a sound basis for safe operation beyond the 40-year term of the original operating license.

2. The license renewal review begins with a defined broad scope but enables the applicant to quickly focus on important equipment that could be negatively affected by aging in the renewal term.

3. The proposed approach for implementing the IPA (a) is consistent with the rule, (b) is technically sound, (c) provides an appropriate integration of the MR and LRR requirements, and (d) will enable both the NRC and the applicant to use their resources efficiently.

4. The scope of ITLR SSCs, including those subject to operability requirements contained in TS LCOs, is defined in the rule and any change would require a rule change. Changes to remove TS LCOs which are not safety significant can be effected outside of license renewal. The proposed IPA approach will result in most SSCs subject to TS LCOs being identified as currently subject to effective programs without the need for detailed analyses.

5. In conducting the IPA, ARDUTLR should be viewed broadly and the IPA should focus on effective programs rather than the identification of aging that is or is not unique to the renewal term. Although SCs may be demonstrated as not being subject to ARDUTLR, as defined in the rule, such a demonstration would require a detailed analysis by the applicant and review by the NRC staff for each SC. The focus of the proposed IPA approach (i.e., on program effectiveness) is a more appropriate and efficient approach.

6. Programs that involve, in part, performance and condition monitoring can be structured so that they can be relied upon to demonstrate that aging is being effectively managed.

7. The IPA can be carried out so that a large majority of SCs can be demonstrated to be included in existing effective programs as evidenced by (a) the equipment being addressed by regulation or in facility technical specifications, with specified acceptance criteria for performance or condition; and (b) inclusion in the maintenance rule scope and requirements.

8. Issues, including those related to fatigue and EQ, that involve the adequacy of the CLB will be addressed as potential safety issues within the existing regulatory process. Where a facility's current licensing bases includes time-dependent elements, some additional analyses and/or actions may be needed to demonstrate that the CLB requirements continue to be satisfied in the renewal term.

9. The level of detail required for information in the application, and for future reporting, is appropriate and does not result in unwarranted administrative burdens. Specifically, (a) ITLR SSCs can be identified in the application by means of appropriate groupings rather than the identification of each piece of equipment, (b) reporting requirements for listed ITLR SSCs are applicable to additions and deletions and should not result in additional burdens, (c) requirements in 10 CFR 54.37(c) for annual reporting of changes will not result in unwarranted burdens for renewal licensees.

10. The form of the renewal license does not affect the scope of the technical issues reviewed or the safety evaluations required.

11. The areas of technical agreement in the industry reports should be incorporated in the standard review plan instead of SERs.

Coordination: The Office of the General Counsel has no legal objection to this paper and is preparing a separate paper to address the legal issues associated with the approach discussed in this paper.

Recommendations: That the Commission:

1. Approve the staff's proposed approach for implementing the integrated plant assessment provisions (10 CFR 54.21(a)) of the license renewal rule including; a broad view of ARDUTLR, a focus on program effectiveness and minimization of documentation for SCs that are already included in an effective program.

2. Approve the staff's positions on the level of detail required in an application.

3. Approve the staff's approach for handling the NUMARC industry reports.

4. Note that, prior to meeting with the Commission, the staff will conduct a public meeting to discuss the proposed positions contained in this paper. The public meeting will be scheduled in mid-March 1993. If we find a need to change our recommendations as a result of the public meeting we will promptly inform the Commission.

On receiving approval from the Commission for recommendations 1, 2, and 3 above, the staff will begin revising both the draft regulatory guide and draft standard review plan to incorporate these recommendations. Additionally, in conducting our initial activities to implement this approach, the staff will inform the Commission of any new issues which are identified.

The staff is developing interoffice action plans to address the upgrading of requirements pertaining to fatigue and EQ for older plants. These plans will integrate ongoing research and licensing reviews to ensure timely resolution.

Unless the Commission directs otherwise, within 1 day from the date of this paper, the staff will release this paper to the public to facilitate public and industry review before the upcoming Commission briefing which is being scheduled for late-March 1993.

James M. Taylor
Executive Director
for Operations

Enclosure:
IPA approach

Commissioners' comments or consent should be provided directly to the Office of the Secretary by COB Monday, March 15, 1993.

Commission Staff Office comments, if any, should be submitted to the Commissioners NLT Monday, March 8, 1993, with an information copy to the Office of the Secretary. If the paper is of such a nature that it requires additional review and comment, the Commissioners and the Secretariat should be apprised of when comments may be expected.

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INTEGRATED PLANT ASSESSMENT

Figure 1 illustrates the integrated plant assessment (IPA) flow path required by the rule at 10 CFR 54.21(a). Preliminary staff estimates of the disposition of systems, structures, and components (SSCs) within the IPA are indicated on the figure.

The staff's proposed approach for implementing the IPA is consistent with the requirements of the rule. All plant equipment would initially be included. SSCs defined in the rule as important to license renewal (ITLR) would be identified at the first step of the IPA, "54.21(a)(1): Scope Review." The scope of ITLR equipment defined in the rule is broad and encompasses more than safety related SSCs, including equipment subject to operability requirements contained in facility technical specification limiting conditions for operation (TS LCOs). Equipment that directly supports SSCs subject to TS LCOs would also be initially identified as ITLR.[1] The staff estimates that approximately 30 percent of plant SSCs would be eliminated from the IPA at this step.

At the second step, "54.21(a)(2): Functional Review," equipment that is part of ITLR systems or structures but that is determined not to be needed to support ITLR functions would be eliminated from the IPA. The staff estimates that only about 5 percent of plant structures and components (SCs) would be eliminated at this step.

The third step of the IPA, "54.21(a)(3): Uniqueness Review," involves the identification, from among the remaining ITLR SCs, of SCs that are not unique and those which could have age-related degradation that is unique to license renewal (ARDUTLR). Age-related degradation that is unique to license renewal is defined in 10 CFR 54.3 and is focused on the effects of the degradation. The definition of ARDUTLR is broad and includes degradation whose effects were not explicitly identified and evaluated by the licensee for the period of extended operation and the evaluation found acceptable by the NRC. Since the effects of age-related degradation during the period of extended operation, for the most part, will not have been explicitly considered, most of the SCs identified in the uniqueness review will be identified as SCs that could have ARDUTLR. This step allows a licensee to forward a technical rationale for its conclusion that an SC could not have ARDUTLR. The staff believes that few SCs would be eliminated from the IPA as not subject to ARDUTLR.

Figure 2 illustrates how the uniqueness review would be carried out. In demonstrating that an SC is not subject to ARDUTLR a detailed justification, submitted to the staff previously or included in the license renewal application, would be required. Two types of potentially acceptable justifications

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[1] Current regulatory practice for TS LCOs defines the necessary criteria that must be satisfied for an SSC to be operable or to have operability. Specifically, an SSC is operable when it is capable of performing its specified function(s) and when all necessary attendant instrumentation, controls, electrical power, cooling or seal water, lubrication, or any other auxiliary equipment that is required for the SSC to perform its function(s) is also capable of performing their related support functions.

of no ARDUTLR could be provided. Long-lived SCs could be evaluated by means of analyses and/or inspection to demonstrate that very little age-related degradation is occurring and that no future actions are needed to manage aging through the renewal term. Assuming NRC agrees with this conclusion, no further IPA review or licensing action would be required.

Additionally, for short-lived SCs, a demonstration of no ARDUTLR could be made on the basis of existing plant replacement programs that are implemented at fixed intervals. Such identification would, however, require an applicant to provide detailed SC-specific justification in the application. The staff expects that the justification for conclusions that such equipment has no ARDUTLR will be based on commitments for continuing licensee action to periodically replace the equipment. As provided in 10 CFR 54.33(b), the staff can include license conditions and technical specifications as necessary to ensure that licensee actions will be continued so that equipment will not experience ARDUTLR. In determining whether or not technical specifications or license conditions are necessary, the staff will consider such factors as safety significance, the nature of administrative controls on commitments and changes to commitments, and reporting requirements.

The staff's recommended approach is focused on the "54.21(a)(5): Effective Program Review" as the principle mechanism for addressing SCs which (1) are already subject to performance or condition monitoring programs for managing the effects of aging, or (2) may require new or enhanced programs. The staff estimates that the IPA approach would result in most plant SCs being identified as already subject to effective programs with minimal documentation in the application. Another group of SCs would be screened out as part of an existing effective program, however, the application would need to identify and justify the acceptance criteria, corrective action requirements and facility review, and procedure controls. Much of this could be done by generic groupings of SCs.

Figure 3 presents additional information on the conduct of the "54.21(a)(5): Effective Program Review." SCs identified as (1) subject to technical specifications or regulations, with specified acceptance criteria for performance or condition, and (2) included in the maintenance rule scope and requirements could be demonstrated to be addressed by existing effective programs. These criteria ensure that SCs are subject to formal regulatory requirements that will effectively manage the effects of aging through the renewal term. As previously noted, the staff estimates that a significant majority of plant SCs would be eliminated from further evaluation on this basis. An application would need to contain minimal documentation to address these criteria. Additionally, since the programs for these SCs are already subject to established NRC change and reporting requirements, the 10 CFR Part 54 change and reporting requirements would not be applicable.

As indicated on Figure 3, the staff estimates that the remaining plant SCs, approximately 5 percent, would require additional evaluations as a result of one of two situations. Information will need to be provided (1) to establish the effectiveness of any new programs determined to be necessary or (2) to justify that no actions are needed to manage aging effects for some SCs.

FIGURE 1: INTEGRATED PLANT ASSESSMENT (IPA)

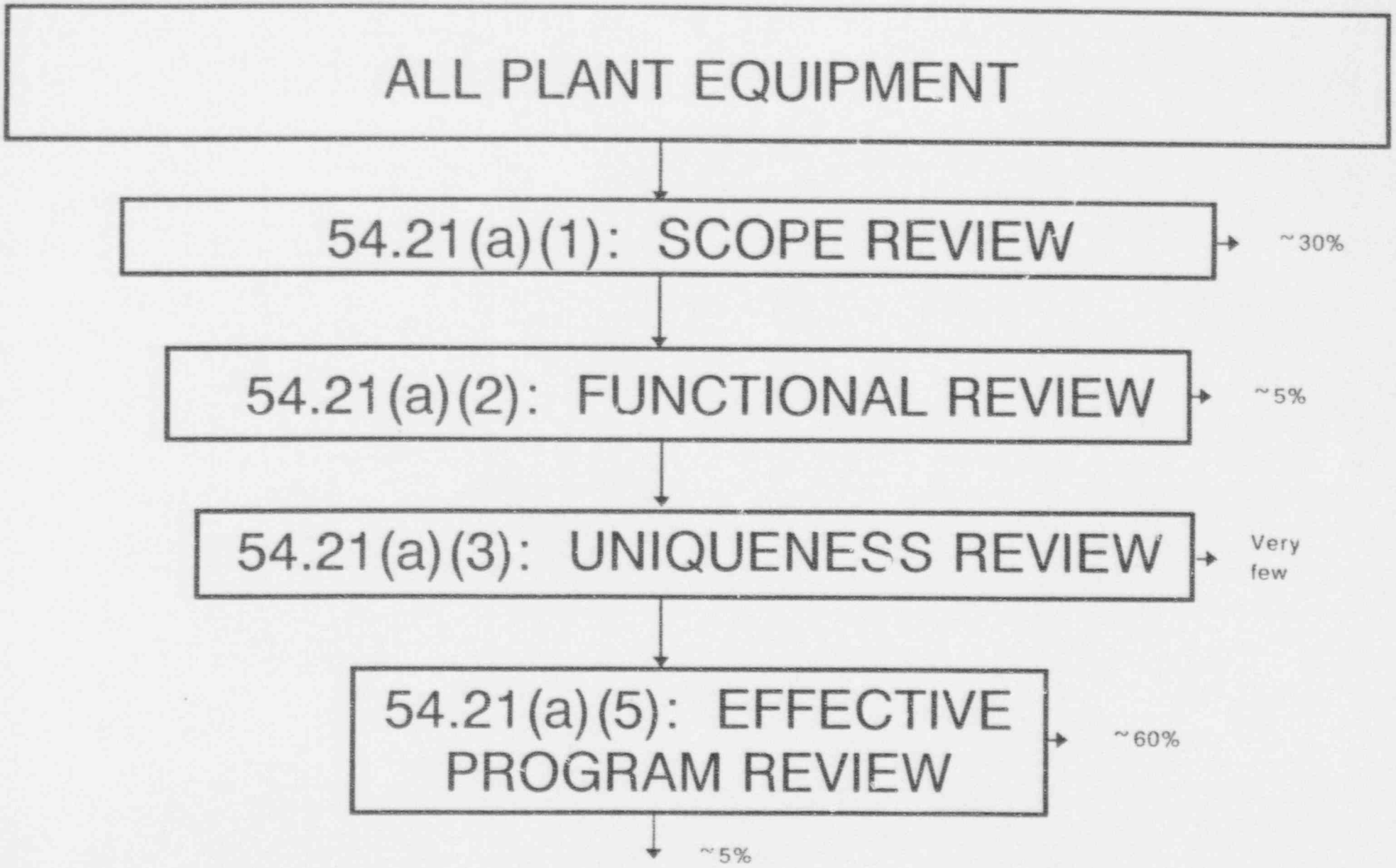


FIGURE 2: UNIQUENESS REVIEW

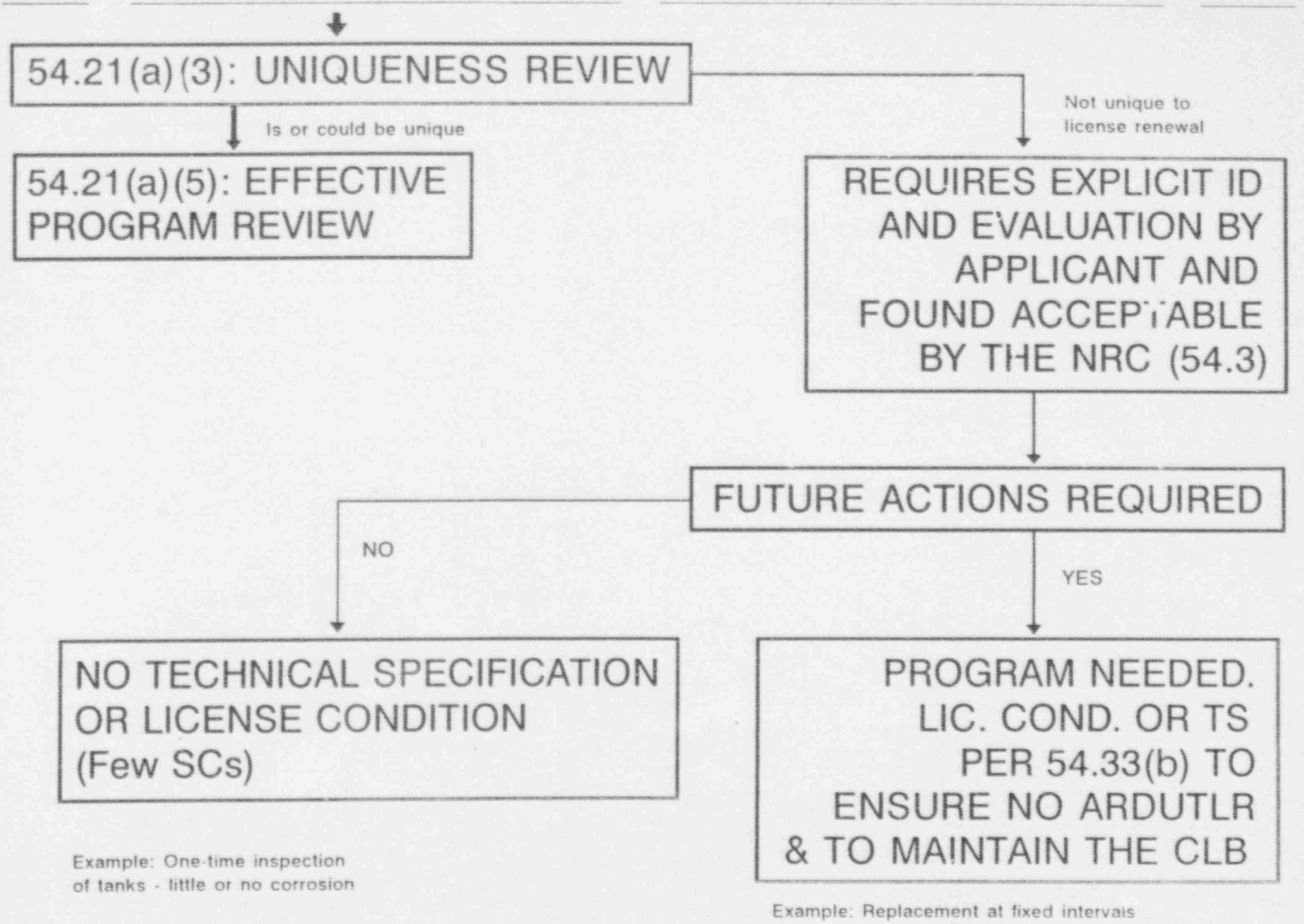
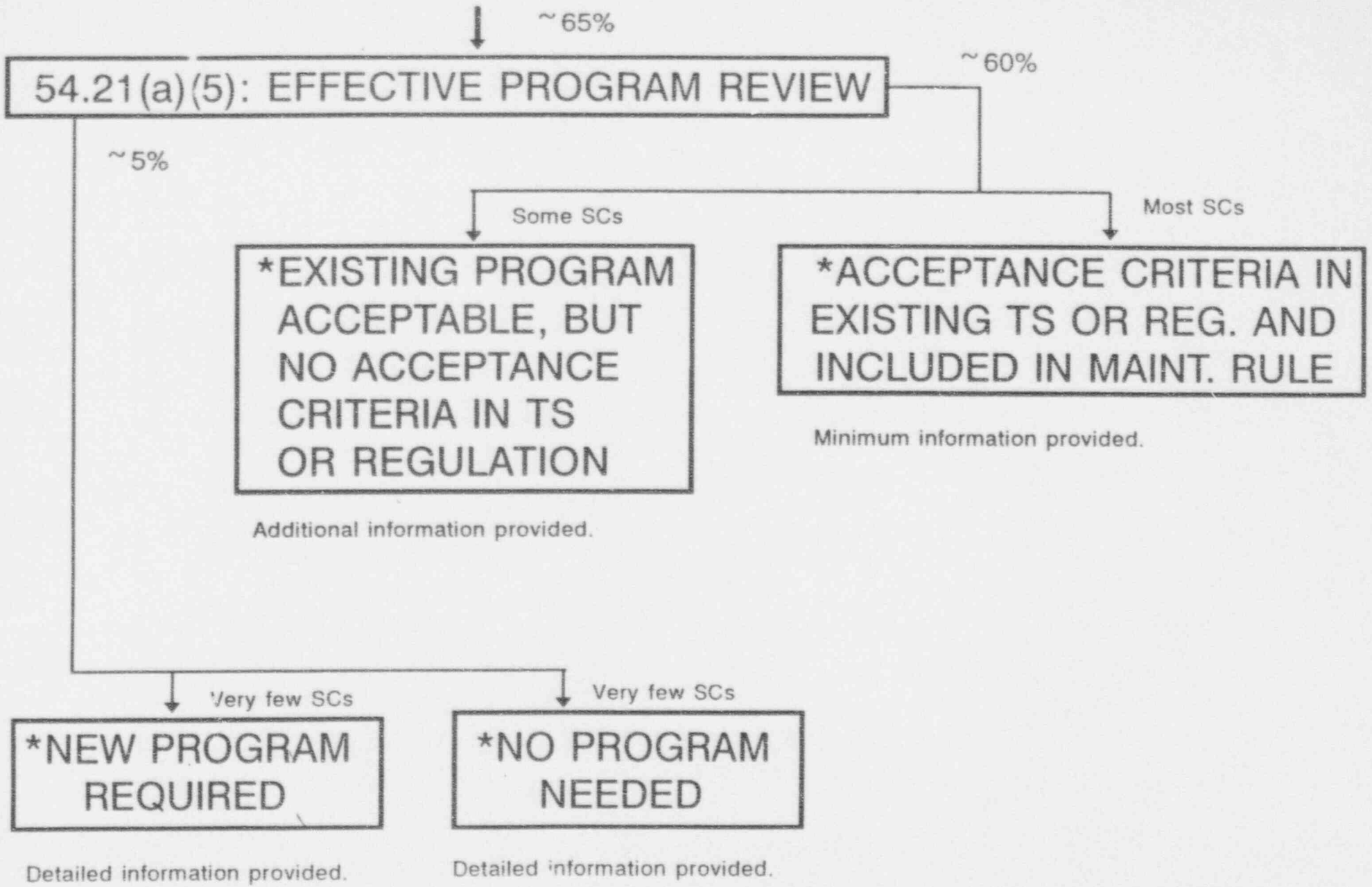


FIGURE 3: EFFECTIVE PROGRAM REVIEW



* Must ensure CLB is maintained during renewal period